

INCHANGE Semiconductor

isc Product Specification

isc Silicon NPN Power Transistor

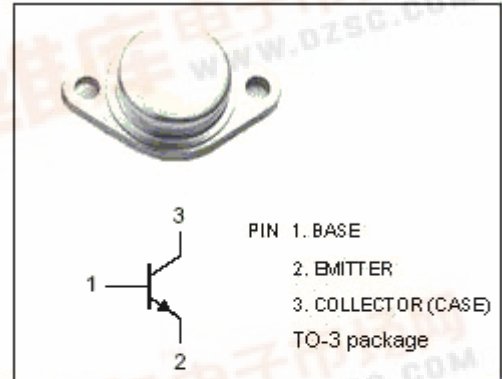
2SC2139

DESCRIPTION

- High Collector-Emitter Breakdown Voltage-
: $V_{(BR)CEO} = 400V$ (Min)
- High Switching Speed

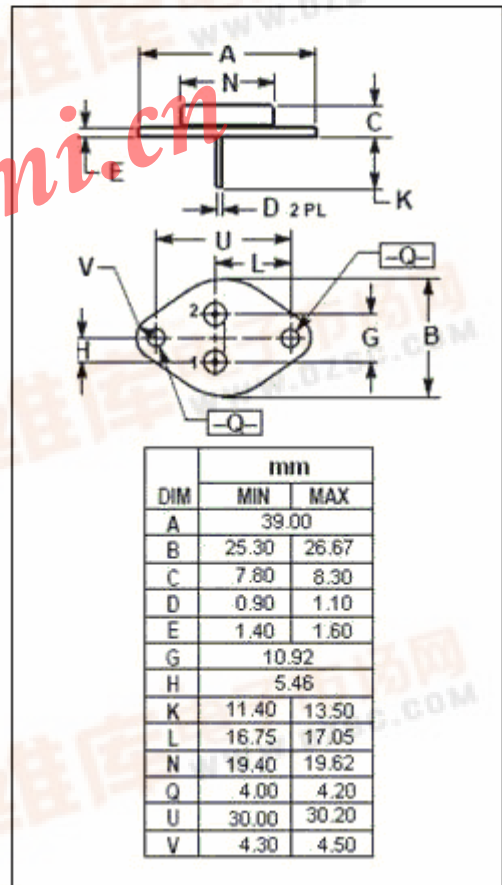
APPLICATIONS

- Switching regulator and high voltage switching applications.
- High speed DC-DC converter applications.



ABSOLUTE MAXIMUM RATINGS($T_a=25^\circ C$)

| SYMBOL | PARAMETER | MAX | UNIT |
|-----------|---|---------|------------|
| V_{CBO} | Collector-Base Voltage | 500 | V |
| V_{CEO} | Collector-Emitter Voltage | 400 | V |
| V_{EBO} | Emitter-Base Voltage | 6 | V |
| I_C | Collector Current-Continuous | 10 | A |
| I_B | Base Current-Continuous | 2 | A |
| P_C | Collector Power Dissipation @ $T_C=25^\circ C$ | 100 | W |
| T_j | Junction Temperature | 150 | $^\circ C$ |
| T_{stg} | Storage Temperature Range | -65~150 | $^\circ C$ |



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ELECTRICAL CHARACTERISTICS

 $T_C=25^{\circ}\text{C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---------------|--------------------------------------|-----------------------------------|-----|------|-----|------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | $I_C=10\text{mA}; I_B=0$ | 400 | | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C=1\text{mA}; I_E=0$ | 500 | | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E=1\text{mA}; I_C=0$ | 6 | | | V |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C=5\text{A}; I_B=0.5\text{A}$ | | | 1.5 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C=5\text{A}; I_B=0.5\text{A}$ | | | 2.0 | V |
| h_{FE} | DC Current Gain | $I_C=5\text{A}; V_{CE}=5\text{V}$ | 10 | | | |
| I_{CBO} | Collector Cutoff Current | $V_{CB}=400\text{V}; I_E=0$ | | | 0.1 | mA |
| I_{EBO} | Emitter Cutoff Current | $V_{EB}=6\text{V}; I_C=0$ | | | 1.0 | mA |

Switching Times

| | | | | | | |
|-----------|--------------|--|--|--|-----|---------------|
| t_r | Rise Time | $V_{CC}=200\text{V}; I_{B1}=-I_{B2}=0.5\text{A}; R_L=40\Omega$ | | | 1.0 | μs |
| t_{stg} | Storage Time | | | | 2.0 | μs |
| t_f | Fall Time | | | | 1.0 | μs |